

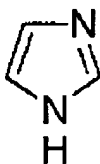
REMARKS

In response to the action, Applicant has cancelled claim 2 and amended claim 8.

Applicant respectfully requests reconsideration in view of the amendments and the following remarks.

The action objected to claim 2 and rejects claims to under 35 U.S.C. § 112, second paragraph for failure to point out and distinctly claim the invention. In particular, the rejection notes that 0 to 5 weight percent abrasive of claim 2 is inconsistent with claim 1's no abrasive limitation. Applicant has cancelled claim 2 to correct the error.

The action rejects claim 8 under 35 U.S.C. § 112, second paragraph, for stating that imidazole is a hydrazine. Claim 8 contains the language "the hydrazine compound contains at least one selected from at least one of the group comprising carbonylhydrazide, imidazole, acetic hydrazide, semicarbazide hydrochloride, and formic hydrazide". Applicant intended that this language covers hydrazine compounds substituted with an imidazole moiety, such as the following:



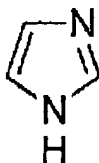
Claim 1 allows for "imido group" substitution and the specification at paragraph 22, lines 7 to 10 provides a specific basis for the imidazole substitution. Although these imidazole-substituted hydrazine compounds are not equivalent to imidazole per se, Applicant has amended claim 8 to remove any clarity issue. Applicant respectfully submits that claim 8, as amended, is sufficiently clear for consideration under 35 U.S.C. § 112, second paragraph.

Applicant respectfully submits that the preamble defines the subject matter and function of the invention in accordance with MPEP 2111.02. Applicant intends to the invention's scope to cover "polishing fluids" that are "useful for polishing tantalum-containing barrier materials of a semiconductor substrate". Applicant does not desire to cover oxygen scavengers, photo sensitive resins, plastic parts for the auto industry or cleaning solutions. In Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951)—cited for precedence by the MPEP at 2111.02—a preamble reciting "An abrasive article" was deemed essential to point out the invention defined by the claims. The MPEP further notes that under these circumstances, the preamble served to further define the structure of the article produced. As in Kropa, the USPTO should consider the preamble's "a polishing fluid" to give life and meaning to the claim.

Another leading case cited for precedence by the MPEP is Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989). According to Corning, the determination of whether preamble recitations are structural limitations can be resolved only on review of the entirety of the application "to gain an understanding of what the inventors actually invented and intended to encompass by the claim." Read in light of the specification, "a polishing fluid" that is "useful for polishing tantalum-containing barrier materials of a semiconductor substrate" means that the invention is fully intended polishing solutions for use in barrier polishing applications in the manufacture of semiconductor substrates. Polishing fluids are useful in preparing multi-layer damascene semiconductor wafers for the addition of subsequent layers. As shown in the specification, the barrier layer requires removal before the application of subsequent layers—because barrier layers typically form adherent structures with a hardness that surpasses adjacent copper and dielectric layer, it is difficult to design effective barrier layers for semiconductor substrates. The invention

covers polishing fluids useful for polishing tantalum-containing barrier materials of a semiconductor substrate as defined in the specification. In addition to the preamble, the body of the claim also contains the limitation "being capable of removing the tantalum-containing barrier materials from a surface of the semiconductor substrate". As a function within the body of the claim, the USPTO must provide consideration to the limitation. Furthermore, the preamble provides an antecedent basis for these terms within the body of the claim. Thus, Applicants respectfully submit that since the claim includes a preamble that limits scope of the invention and the body of the invention contains a similar limitation, the USPTO should consider the patentability of the claimed invention direct to fluids useful for polishing tantalum-containing barrier materials of a semiconductor substrate.

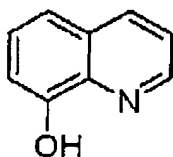
The action rejects claims 1 to 6 and 8 under 35 U.S.C. § 102(c) for being anticipated by Wang et al. The Wang et al. reference does disclose cyclic compounds such as imidazole, benzotriazole, benzimidazole and benzothiazole for forming passivation layers. For example, imidazole has a structure as follows:



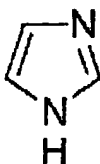
These azoles do not have or suggest the claimed imine or hydrazine structures. Thus since azole structures do not disclose or suggest the claimed imine or hydrazine structure, Wang et al. do not anticipate the claims or represent a prima facie case of obviousness.

The action rejects claims 1 to 6 and 8 under 35 U.S.C. § 102(b) for being anticipated by Avanzino (US Pat. No. 6,350,687). The Avanzino reference teaches the use of copper corrosion

inhibitors including 8-hydroxyquinoline and imidazole. These compounds have structures as follows:



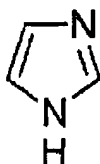
8-Hydroxyquinoline



Imidazole

These claimed corrosion inhibitors do not have or suggest the claimed imine or hydrazine structures. Thus since azole structures do not disclose or suggest the claimed imine or hydrazine structure, Avanzino does not anticipate the claims or form a prima facie case of obviousness.

The action rejects claims 1 to 6 and 8 under 35 U.S.C. § 102(b) for being anticipated by Fang (US Pat. No. 6,805,812). The Fang reference does disclose cyclic compounds such as benzotriazole, triazole, benzimidazole, imidazole and benzothiazole for forming passivation layers. For example, imidazole has a structure as follows:



These azoles do not have or suggest the claimed imine or hydrazine structures. Thus since azole structures do not disclose or suggest the claimed imine or hydrazine structure, Fang does not anticipate the claims or form a prima facie case of obviousness.

The action rejects claims 1 to 8 under 35 U.S.C. § 102(b) for being anticipated by Rothgery (US Pat. No. 4,479,917). Rothgery teach a composition for scavaging oxygen and inhibiting corrosion. Inhibiting corrosion teaches away from Applicant's claimed polishing solution. Because Rothgery teach inhibiting corrosion, the composition of Rothgery would not

inherently function as polishing fluid. Thus, since Applicant claims an abrasive-free polishing solution and Rothgery teach an anti-corrosion formulation, the reference does not anticipate or form a prima facie case of obviousness.

The action rejects claims 1 to 8 under 35 U.S.C. § 102(b) for being anticipated by Wojtczak et al. (US Pat. Pub. No. 20020065204). Wojtczak disclose a cleaning solution to remove plasma ash residue from the resist plasma etching step, not the claimed polishing fluid. Furthermore, at paragraph 15, Wojtczak et al. disclose that the formulations significantly reduce the removal of undesirable corrosion or removal of copper metal structures. This teaches away from Applicant's claimed invention capable of removing tantalum-containing barrier materials from semiconductor substrates. Thus, since Applicant claims an abrasive-free polishing solution and Wojtczak et al. teach an anti-corrosion formulation for use in cleaning plasma ash, the reference does not anticipate or form a prima facie case of obviousness.

The action rejects claims 1 to 8 under 35 U.S.C. § 102(b) for being anticipated by Dewhurst. (US Pat. No. 5,420,188). Dewhurst disclose a mold release agent that includes a zinc carboxylate. Because zinc can poison semiconductor dielectrics, it teaches away from the claimed barrier polishing fluid. Thus, since Applicant claims an abrasive-free polishing solution and Dewhurst teach a zinc-containing mold release formulation, the reference does not anticipate or form a prima facie case of obviousness.

The action rejects claims 1 to 8 under 35 U.S.C. § 102(b) for being anticipated by Takagi. (US Pat. No. 6727042). Takagi et al. disclose a photosensitive resin composition that can be polymerized under light radiation. The formulation is light sensitive and forms an insoluble polymer upon activation with light. Because the intense energy associated with polishing could activate the polymer to polymerically join the wafer to the polishing pad, this reference also


teaches away from the claimed invention. Thus, since Applicant claims an abrasive-free barrier polishing solution and Takagi et al. teach a plastic-forming resin, the reference does not anticipate or form a prima facie case of obviousness.

Applicant respectfully submits that the amended claims are in proper form for allowance and respectfully requests reconsideration. If a telephone call would expedite prosecution, please call me at the number listed below.

Respectfully submitted,

May 18, 2006
Date

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